



Operation/Reference Guide

NXR-ZGW/-ZRP

NetLinx ZigBee Compatible Gateway
and Repeater



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Overview

The NXR-ZGW (**FG5791-01**) is an Ethernet to ZigBee wireless gateway. The NXR-ZGW features a 10BaseT, half duplex Ethernet port capable of Power over Ethernet (PoE), 16 Mbytes of Flash, 16 Mbytes of SDRAM, and a ZigBee module, and is controlled via a web server interface. The NXR-ZRP (**FG5791-02**) is a ZigBee wireless repeater that features 16 Mbytes of Flash, 16 Mbytes of SDRAM, and a ZigBee module.

NXR-ZGW Specifications

The following table outlines the specifications for the NXR-ZGW.

NXR-ZGW (FG5791-01) Specifications	
Dimensions (HWD):	• .906 x 2.500 x 3.424 (23.01 mm x 63.50 mm x 86.96 mm), depth does not include antenna
Weight:	• 0.35 lbs (158.75g)
Power:	10.5 - 18 VDC; 13.5 (nominal operation voltage), or Power over Ethernet (PoE) Class 2
Memory:	<ul style="list-style-type: none"> • 16 Mbytes of Flash • 16 Mbytes of SDRAM
Radio Specifications:	
Frequency	IEEE 802.15.4
Operating channels	• 11 - 26
Modulation technique	• DSS
Output power	• Region/country specific
Coverage area	165 feet (50.2m)
Firmware/Software Specifications:	
Management	• Built-in browser-based management with User Name/Password authentication
IP configuration	• Static IP or DHCP client (default is static, 192.168.1.140)
Communications	• The NXR-ZGW communicates with a Netlinx master over TCP/IP encapsulating the ICSP protocol via a physical Ethernet connection. The ICSP device number can be set via the browser-based management system.
Front Components:	
LEDs	<ul style="list-style-type: none"> • PWR/STATUS - A green LED that blinks to indicate the device is installed and communicating properly. Power ON, but no master connection, is indicated with a solid light; Power OFF is indicated with no light. • LAN - A green LED indicates an Ethernet connection is established. The LED blinks to indicate both sending and receiving information via Ethernet. • RF - The LED is solid when end devices are connected; end devices not connected is indicated with no LED light; the LED blinks to indicate activity.
Antenna Mount	A reverse SMA connection that supports a 2.4GHz antenna.
ID Button	When used in conjunction with NetLinx Studio, sets the device and system numbers for the NXR-ZGW. Press and hold for approximately 30 seconds to return the NXR-ZGW to factory default settings.

NXR-ZGW (FG5791-01) Specifications (Cont.)	
Rear Components: Power connector	Two power options are available: <ul style="list-style-type: none"> • 2-pin 3.5mm Phoenix connector • Power Over Ethernet (PoE) - powers the device through the CAT5 cable. Both Power and Data can be transmitted simultaneous through the CAT5 cable when using the appropriate equipment.
Ethernet port	10BaseT modular (RJ-45) connector - used to connect the NXR-ZGW to your LAN and/or to connect your third party device to the LAN when the NXR-ZGW is used as a gateway.
Certifications:	<ul style="list-style-type: none"> • FCC ID: CWU-ZGW • IC ID: 5078A-ZGW • CE • IEC-60950 • TELEC
Operating/Storage Environments:	<ul style="list-style-type: none"> • Operating Temperature: -30°C (-22°F) to 70°C (158°F) • Relative Humidity: 5% to 85% non-condensing; intended for indoor use only
Included Accessories:	<ul style="list-style-type: none"> • 2.4GHZ, MONO, RSMA, 3.5IN, 2.0DBI Antenna (70-0012-SA) • Rubber feet • Velcro mounting strip • Power Supply (24-5791-SA)
Other AMX Products:	<ul style="list-style-type: none"> • Mio Modero R-3 Remote (FG148-03) • Mio Modero R-4 Remote (FG148-04) • NXR-ZRP NetLinx ZigBee Repeater (FG5791-02) • NXA-WAP 2403A 3 dBI Antenna (FG2255-20) • NXA-WAP 2405A 5.5 dBI Antenna (FG2255-21) • NXA-WAP 2413A Mounting Bracket (FG2255-24)

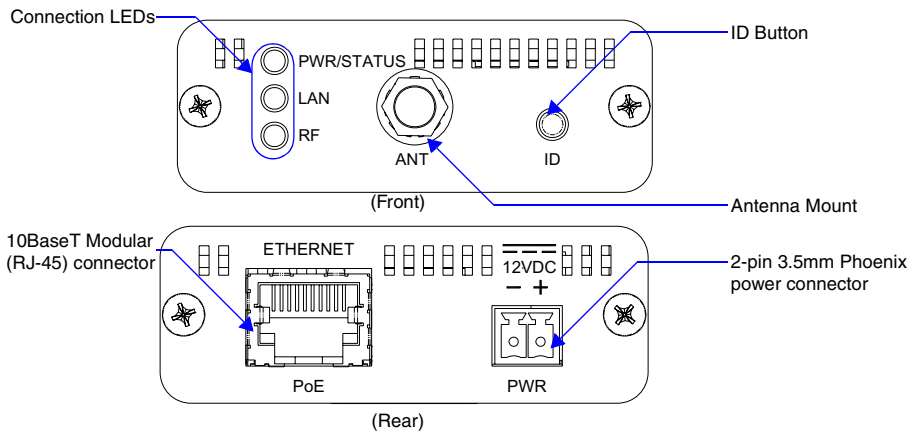


FIG. 1 Front and Rear Components of the NXR-ZGW

NXR-ZRP Specifications

The following table outlines the specifications for the NXR-ZRP.

NXR-ZRP (FG5791-02) Specifications	
Dimensions (HWD):	• 906 x 2.500 x 3.424 (23.01 mm x 63.50 mm x 86.96 mm) depth does not include antenna
Weight:	• 0.25 lbs (113.39g)
Power:	10.5 - 18 VDC; 13.5 (nominal operation voltage)
Memory:	<ul style="list-style-type: none"> • 16 Mbytes of Flash • 1 Megabit external memory
Radio Specifications:	
Frequency	IEEE 802.15.4
Operating channels	• 11 - 26
Modulation technique	• DSS
Output power	• Region/country specific
Coverage area	165 feet (502.m)
Firmware/Software Specifications:	
Communications	The NXR-ZRP communicates with a Netlinx master via a NXR-ZGW. The NXR-ZGW communicates with a Netlinx master over TCP/IP encapsulating the ICSP protocol via a physical Ethernet connection. The ICSP device number can be set via the browser-based management system.
Front Components:	
LEDs	<ul style="list-style-type: none"> • PWR/STATUS - A green LED that blinks to indicate the device is programmed and communicating properly. Power ON, but no master connection, is indicated with a solid light; Power OFF is indicated with no light. • ICSP - The LED is solid when ICSP connection is in place with the NetLinx master. • RF - The LED is solid when end devices are connected; end devices not connected is indicated with no LED light; the LED blinks to indicate activity.
Antenna Mount	A reverse SMA connection that supports a 2.4GHz antenna.
Reset Button	Press and hold for approximately 10 seconds to return the NXR-ZRP to factory default settings.
Rear Components:	
Power connector	• 2-pin 3.5mm Phoenix connector
Certifications:	<ul style="list-style-type: none"> • FCC ID: CWU-ZRD • IC ID: 5088A-ZRD • CE • IEC-60590 • TELEC
Operating/Storage Environments:	<ul style="list-style-type: none"> • Operating Temperature: -30°C (-22°F) to 70°C (158°F) • Relative Humidity: 5% to 85% non-condensing; intended for indoor use only
Included Accessories:	<ul style="list-style-type: none"> • 2.4GHZ, MONO, RSMA, 3.5IN, 2.0DBI Antenna (70-0012-SA) • Rubber feet • Velcro mounting strip • Power Supply (24-5791-SA)

NXR-ZRP (FG5791-02) Specifications (Cont.)	
Other AMX Products:	<ul style="list-style-type: none"> • Mio Modero R-3 Remote (FG148-03) • Mio Modern R-4 Remote (FG148-04) • NXR-ZGW NetLinx ZigBee Gateway (FG5791-01) • NXA-WAP 2403A 3 dBI Antenna (FG2255-20) • NXA-WAP 2405A 5.5 dBI Antenna (FG2255-21) • NXA-WAP 2413A Mounting Bracket (FG2255-24)

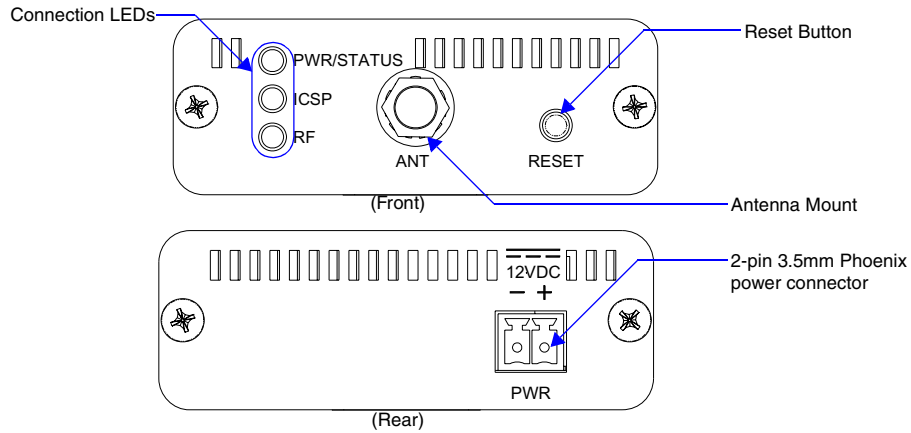


FIG. 2 Front and Rear Components of the NXR-ZRP



Connection to the Repeater device from either the NXR-ZGW or the Mio Modero® R-3 or R-4 requires download and installation to the repeater of ZigBee Module firmware version 1.01.12, available from www.amx.com.

How ZigBee works

The ZigBee wireless personal network technology protocol provides a framework for reliable, cost-effective, low-power, wireless networked, monitoring and control products based on an open global standard. (More information on the ZigBee standard is available at <http://www.zigbee.org>.) Many ZigBee-enabled devices use ZigBee exclusively as a communication and control interface, but not all: some have the option of switching between ZigBee, standard IR, or a combination of the two.

The NXR-ZGW, acting as a gateway, allows ZigBee-enabled devices to communicate both to and from an ICSP master. A device connects to the NXR-ZGW and is then represented to the master as an ICSP device. The master then communicates to the device through ICSP messages via a translation step at the NXR-ZGW level.

The NetLinx master regularly sends "heartbeat" queries to the NXR-ZGW device; in return, the NXR-ZGW provides the master with a response for all devices on the ZigBee network that have an ICSP address and use ZigBee as their primary interface to the master. The response provided by the NXR-ZGW is based on the last known status of the ZigBee-enabled device. If the NXR-ZGW determines it is no longer in communication with a device, it will indicate to the master that the device is non-responsive or has left the network.

Network structure

A ZigBee network is a Personal Area Network (PAN) consisting of one gateway, the option of one or more repeaters, and one or more end devices.

A *gateway* initiates a ZigBee network and all devices linking to the PAN gateway do so through either direct links or through repeaters. The gateway's job is to establish the network's parameters, e.g., channel and PAN ID. Within each PAN, a gateway or repeater can have up to 8 end devices, depending on the design of your system. Additional repeaters may be added to extend the range of your PAN, but care should be taken to understand the associated increases in bandwidth consumption and message latency. The topology information is contained in the Browser-based Configuration Manager pages (please refer to the *NXR-ZGW Browser-based Configuration Manager Pages* section on page 15 for more information).

A *repeater* like the NXR-ZRP is used to expand the coverage of NXR-ZGW gateways. Every device in the PAN has a parent (a device connecting it to the master), and repeaters can have children (devices using them as a conduit to the master). Adding repeater devices to a network can reduce the number of hops an end device needs to make to reach the gateway. Adding repeaters also extends the coverage area for the entire network. Any device attached to a repeater NXR-ZRP appears attached to the gateway NXR-ZGW in the Browser-Based Configuration Manager pages.

An *end device* will always connect to a repeater or gateway based on the least depth of the connection, and then the best quality. For instance, given a choice between connecting to a repeater with two hops to a gateway or directly to a gateway, an end device will always connect first to the gateway, even if the repeater has a slightly better connection. End devices cannot have children. The use of the NXR-ZGW and NXR-ZRP allow ZigBee-type devices to roam seamlessly from repeater to repeater within the same PAN ID.

Because of power saver options and other features, mobile end devices tend to sleep frequently and thus enter and leave the network regularly. Upon awakening, the end device may be in a new physical location or the network may have changed channels. The end device will seamlessly search for a new parent and scan channels upon awakening.



NOTE

For more information on ZigBee network communication with other AMX products, refer to the "Getting the Most From Your Mio Modero R-4" chapter in the Mio Modero R-4 remote user manual, available at www.amx.com.

Mesh Network Arrangements

The following installations depend upon the criteria for the network. A home installation would perhaps only need one NXR-ZGW or PAN ID where a commercial installation might require a NXR-ZGW and several NXR-ZRPs.



NOTE

When adding a ZigBee network to a NetLinx master, an Ethernet switch or hub must be added to the master for proper function of the ZigBee network.

Single PAN ID installations

After you have installed the NXR-ZGW, you should consider the arrangement of devices. The following is an example where there is only one NXR-ZGW in the installation and thus only one PAN ID with which to contend.

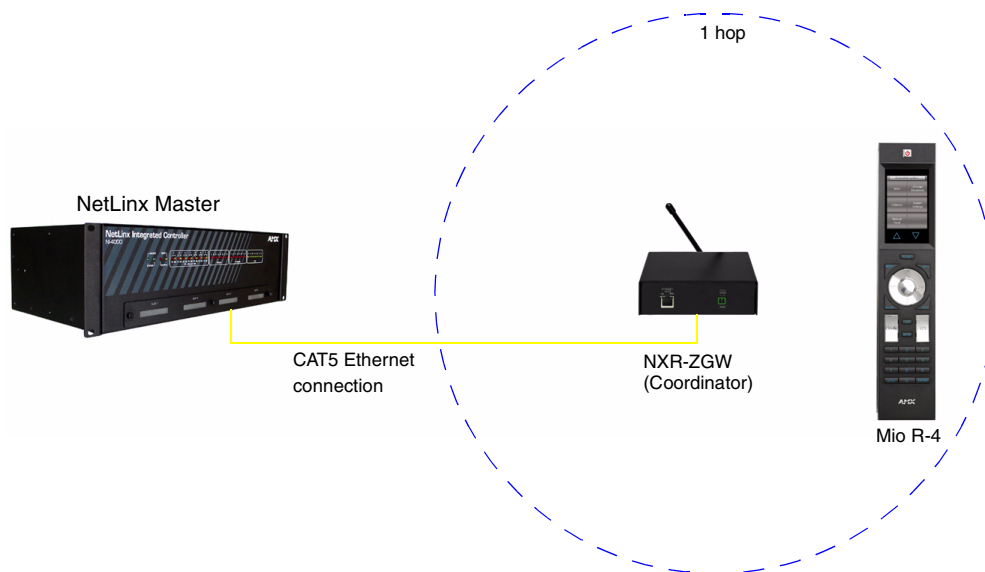


FIG. 3 Single PAN ID Network

Multiple PAN ID installations

A more commercial application of the NXR-ZGW is having multiple gateways and specific devices operating in close proximity of each other. End devices and repeaters of different networks can operate side-by-side without interference if they have different PAN ID numbers. See *Setting up a Network* section on page 23 for setting the PAN ID and adding device EUI Addresses.

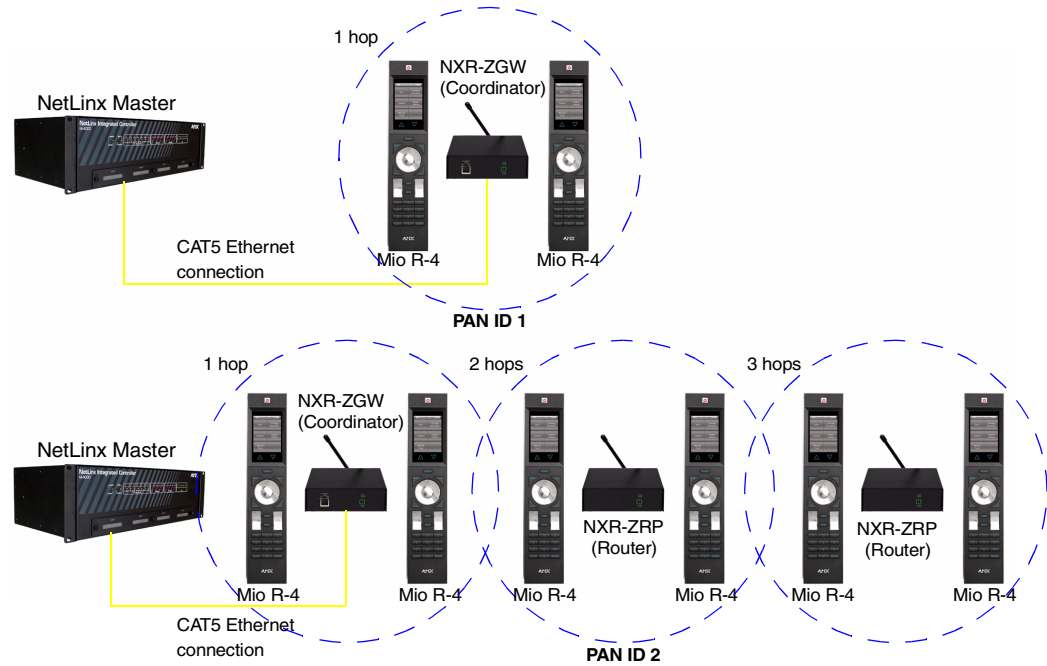


FIG. 4 Multiple PAN ID Network

FCC Compliance

This device complies with Part 15 of the FCC rules. Subject to the following two conditions:

1. This device must not cause harmful interference and
2. This device must accept all interference, including interference that interferes with the operation of this device.

Modifications not expressly approved by the manufacturer will void the user's authority to operate the equipment."



This device has been evaluated and found to be compliant with the FCC Rules for RF Exposure when the device is operated at a minimum separation distance of 2 cm. from the user and nearby persons. Operation of this device at closer distances should be avoided.

Installation

Things to Consider Before Starting

Several factors will help decide the best place to install NXR-ZGW and NXR-ZRP devices. Before installing, consider the following:

Location and Antenna Direction

The best location for NXR-ZGW and NXR-ZRP devices are usually in the center of your wireless network, with line of sight to all of your mobile devices. Try to place the antenna in a position that can best cover your wireless network. Normally, the higher you place the antenna, the better the performance you receive. Try to place the gateway and repeater devices a reasonable distance away from each other to minimize antenna feedback. FIG. 5 displays the coverage for various positioning of the antenna.

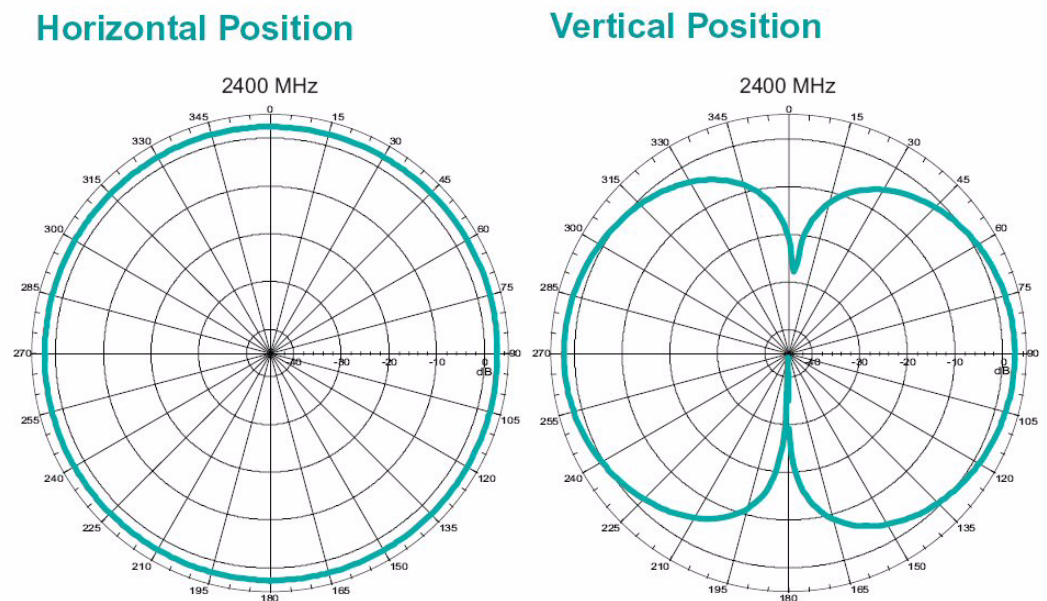


FIG. 5 Horizontal and Vertical Antenna Radiation



NOTE

For minimal interference, try to keep any installed NXR-ZGW at least 10 feet (3.048m) from any WiFi access points.



NOTE

Vertical radiation may vary slightly based on the selected channel.

Connecting the Optional Accessory Antennas

Several accessory 2.4GHz antennas are available for use with NXR-ZGW and NXR-ZRP devices. Each of these antennas is uniquely suited to meet a wide variety of installation requirements.

Determining the Power Source

Based upon location and the availability of electricity, select one of the two following methods for power:

- **2-pin 3.5mm captive-wire connector** - Prepare the captive wire pair and insert it into the connector. See *Preparing captive wires for the 2-pin 3.5 mm mini-captive wire connector* section on page 10. This is the only power option for the NXR-ZRP device.
- **Power Over Ethernet (PoE)** - If no electrical outlet is available, you can plug one end of the CAT5 Ethernet cable into the RJ-45 jack of the NXR-ZGW and plug the other end of the CAT5 cable into PoE supply equipment (*this unit must be 802.3af compliant*). The NXR-ZGW is rated as a PoE Class 2 device that consumes about 2.5W, about 50mA to 60mA at 48V.

The ability to choose a power supply option increases the availability of deployment locations. In addition, the NXR-ZGW makes installation into areas previously without power much easier, since it is no longer necessary to run new electrical wires to the device.

Connecting the NXR-ZGW to a LAN

Insert one end of the CAT5 Ethernet cable into the rear RJ-45 jack (illustrated in FIG. 1) and connect the other end of the same cable to a master. See *Mesh Network Arrangements* section on page 6 for possible network configurations.

Connecting Power to the NXR-ZGW and NXR-ZRP

The NXR-ZGW receives power via either PoE or 2-pin 3.5 mm mini-captive wire connection, while the NXR-ZRP only utilizes the 2-pin 3.5 mm mini-captive wire connection.



NOTE

When connecting both Ethernet and mini-captive wire connections to the NXR-ZGW, PoE is overridden by the captive wire connection. PoE is only engaged if Ethernet is the only power source available to the device.

If PoE is selected, the NXR-ZGW will draw power through the CAT5 Ethernet cable (see *Determining the Power Source* section on page 10). If the 2-pin 3.5 mm mini-captive wire is selected, the following steps are necessary:

Preparing captive wires for the 2-pin 3.5 mm mini-captive wire connector

You will need a wire stripper and flat-blade screwdriver to prepare and connect the captive wires.

1. Strip 0.25 inch (6.35 mm) of wire insulation off all wires.
2. Insert each wire into the appropriate opening on the connector according to the wiring diagrams and connector types described in this section.
3. Turn the screws clockwise to secure the wires in the connector. Do not over-torque the screws; doing so can bend the seating pins and damage the connector.

Using the PSN NetLinx connector for power

The PWR and GND cable from the 12 VDC power supply must be connected to the corresponding location on the 2-pin 3.5 mm mini-captive wire connector (FIG. 6).

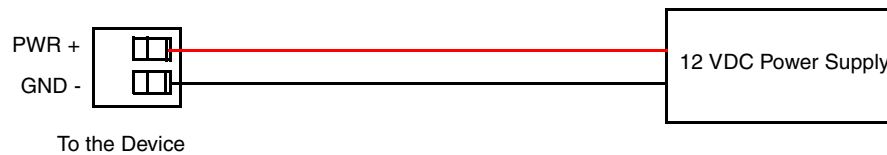


FIG. 6 12 VDC Power Connector Wiring Diagram

1. Insert the PWR and GND wires on the terminal end of a PSN 2-pin 3.5 mm mini-captive wire cable. Match the wiring locations of the +/- on both the power supply and the terminal connector.
2. Tighten the clamp to secure the two wires. Do not over-torque the screws; doing so may strip the threads and damage the connector.
3. Verify the connection of the 2-pin 3.5 mm mini-captive wire to the power supply.

Table top installation of the NXR-ZGW and NXR-ZRP

Using the provided rubber pads, place one in each bottom corner of the device.

Rack mounting the NXR-ZGW and NXR-ZRP

Using the Velcro pad provided, remove the backing and adhere one side to the device. Remove the backing of the other side of the Velcro and place it on your rack where you want the NXR-ZGW/ZRP mounted.

Before continuing, consult *Setting up a Network* section on page 13.

Setting up a Network

After you have established the location of the gateway (page 9), connected it (page 10), provided power (page 10), and placed the device in either a rack (page 11) or wall installation (page 11) you can then begin configuring the NXR-ZGW and adding an NXR-ZRP and ZigBee-compatible devices to the network.

1. Confirm the NXR-ZGW is receiving power by checking the PWR LED (See “Front and Rear Components of the NXR-ZGW” on page 2.).
2. Using a PC connected to your NetLinx system, navigate to the NXR-ZGW Browser-based Configuration Manager (See “NXR-ZGW Browser-based Configuration Manager Pages” on page 15.) in your preferred browser application. The default IP address for the NXR-ZGW is 192.168.1.140.
3. Go to the NetLinx setup page and configure the NXR-ZGW to communicate with the master.
4. Go to the NXR-ZGW Browser-based Configuration Manager PAN page (See “Personal Area Network (PAN)” on page 19.) and change the PAN ID.
5. Turn on AMX ZigBee-compatible devices one at a time, e.g., Mio R-3, Mio R-4 or NXR-ZRP. Select the correct new PAN ID.
6. For devices that do not have displays (NXR-ZRP), or not enough display to select the PAN ID to join a network, place each device one at a time near the gateway, turn one of them on, and configure it using the gateway web pages before turning on the next one. Then use the PAN pages to change the devices over to a new PAN ID.
7. This method may also be used if you do not want to go to each ZigBee compatible device to set the PAN ID; however, once each device is set, the change must be done to the gateway itself. It may be necessary to cycle power on each device for them to come online.
8. Due to the wireless nature of the ZigBee network, temporary interference (such as leaving a room or large objects passing between a remote and its gateway device) may prevent a command from reaching the NetLinx master.



CAUTION

If this happens while increasing volume, the master may receive the command to increase the volume but not the command to stop increasing it.

Therefore, programmers should consider setting safeguards for volume control, either established volume limits or timeouts with the NetLinx master or more interactive adjustment from the remote (i.e., direct volume control), to prevent issues with lost commands.



NOTE

To maximize the user experience and prevent delays in commands being received and processed, limiting the number of "hops" between a ZigBee-enabled device and the NetLinx master to two or less is highly recommended. For more information, see both the How ZigBee works section on page 5 and the "Getting the Most From Your Mio Modero R-4" chapter in the Mio Modero R-4 remote user manual, available at www.amx.com.

NXR-ZGW Browser-based Configuration Manager Pages

To access the Configuration Manager pages, enter the IP address of the NXR-ZGW into your web browser; the default IP address for the NXR-ZGW is **192.168.1.140**. When prompted, enter your username and password in the spaces provided.



NOTE

Upon accessing the Configuration Manager, the user must enter a username and password. The default entries are “**Admin**” and “**1988**”; changing the password as soon as possible is highly recommended.



NOTE

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Summary of Gateway Settings

The *Summary of Gateway Settings* page is the initial access point for the user.

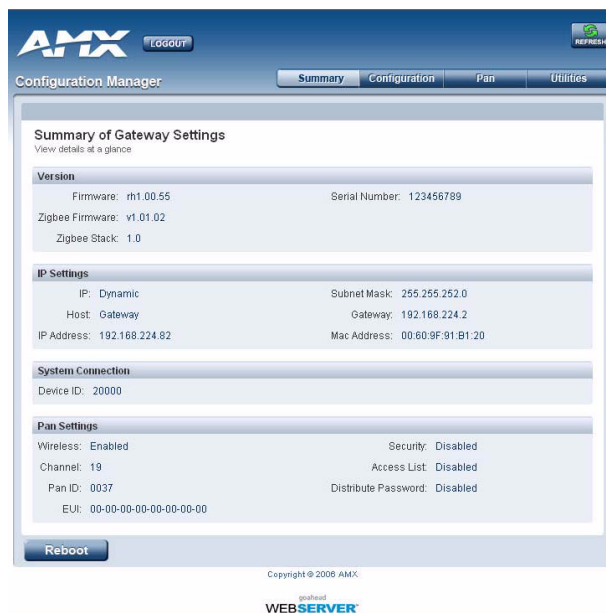


FIG. 7 Summary Page

Summary Page	
Firmware	The version of the software running on the device.
ZigBee Firmware	The version of software running on the ZigBee processor
ZigBee Stack	The main version of software running on the ZigBee processor
IP	The IP address of the unit
Host	The hostname of the unit.
IP Address	The IP address of the unit.
Subnet Mask	The subnet mask associated with IP addressing

Summary Page (Cont.)	
Gateway	The IP gateway used by this unit.
Device ID	The ICSP device number of this unit
Wireless	The state (Disabled/Enabled) of the wireless connection.
Channel	The channel the ZigBee wireless will use.
Pan ID	The ZigBee personal area network ID used.
Access List	The current state of the Access List (Disabled/Enabled).
Distribute Password	Current mode of ZigBee password distribution (Disabled/Enabled).

Checking the firmware version

The firmware version is listed on the *Summary of Gateway Settings* page of the NXR-ZGW Browser-based Configuration Manager.

Checking the ZigBee firmware version

The ZigBee firmware version is listed on the *Summary of Gateway Settings* page of the NXR-ZGW Browser-based Configuration Manager.

Determining the IP settings of the NXR-ZGW

1. Browse to the *Summary of Gateway Settings* page of the NXR-ZGW Browser-based Configuration Manager.
2. The IP settings are listed in the aptly-named section *IP Settings*.

Finding the ICSP device number of this unit

1. Browse to the *Summary of Gateway Settings* page of the NXR-ZGW Browser-based Configuration Manager.
2. The ICSP device number is listed under the section *System Connection, Device ID*.

Determining the PAN settings of the NXR-ZGW

1. Browse to the *Summary of Gateway Settings* page of the NXR-ZGW Browser-based Configuration Manager.
2. The PAN settings are listed in the aptly-named section *PAN Settings*.

Rebooting the Configuration Manager

1. Browse to the *Summary of Gateway Settings* page of the NXR-ZGW Browser-based Configuration Manager.
2. Click the **Reboot** button on the left bottom of the *Summary of Gateway Settings* page.

Configuration

Network IP Settings

The *Network IP Settings* page is used to set IP and DNS addresses. The IP address can be either a static or dynamic assignment.

The screenshot shows the 'Network IP Settings' page in the AMX Configuration Manager. The page has a header with 'AMX' logo, 'LOGOUT', and 'REFRESH' buttons. Below the header are tabs for 'Summary', 'Configuration', 'Part', and 'Utilities'. The 'Configuration' tab is active, and within it, 'IP Settings' is selected. The main content area is titled 'Network IP Settings' and contains the following fields:

- IP Address:** Radio buttons for 'Dynamic' (selected) and 'Static'. Fields for 'Subnet Mask' (255.255.252.0) and 'Gateway' (192.168.224.2).
- Host:** Text field containing 'Gateway'.
- IP Address:** Text field containing '192.168.224.82'.
- DNS Address:** Text field for 'Domain Suffix' (amx.internal), and text fields for 'Primary DNS' (192.168.20.7) and 'Secondary DNS' (192.168.20.9).

At the bottom of the form are 'Cancel' and 'Accept' buttons. Below the form, there is a copyright notice 'Copyright © 2005 AMX' and a 'WEBSERVER' logo.

FIG. 8 IP Settings Page

IP Address	
IP	<ul style="list-style-type: none"> • Dynamic: IP address and subnet mask are requested from the DHCP server. • Static: User provides IP address information.
Host	The hostname of the unit.
IP Address	The IP address of the unit.
Subnet Mask	The IP subnet mask of the unit.
Gateway	The gateway used for IP routing.

The DNS Address allows the IP addresses of domain name servers to be specified.

DNS Address	
Domain Suffix	The domain name.T
Primary DNS - Secondary DNS	Domain Name System IP numbers associated to the domain suffix.

Setting the IP Address

1. In the menu at the top of the NXR-ZGW Browser-based Configuration Manager, select *IP Settings* under the section *Configuration*.
2. Click the radio button for either *Dynamic* or *Static*. If you selected *Dynamic*, the DHCP server automatically provides the IP address.
3. If configured for *Static*, type the IP address in the field provided.
4. If necessary, type the subnet mask and gateway in the fields provided.
5. Click **Accept**.
6. In the *The system will need to reboot for changes to take effect* window, click **OK**.

Setting the DNS Address

1. In the menu at the top of the NXR-ZGW Browser-based Configuration Manager, select *IP Settings* under the section *Configuration*.
2. Click the **Static** radio button in the IP Address section.
3. Type the Domain Suffix in the field provided.
4. Type the necessary DNS IP numbers in the fields.
5. Click **Accept**.
6. In the *The system will need to reboot for changes to take effect* window, click **OK**.

User Settings

This page is used to set the username and password for access to the NXR-ZGW web server pages.



FIG. 9 User Settings page

User Settings Page	
New Username	Text field for new username.
New Password	Text field for new password.
Re-type Password	Text field to confirm new password.

Setting a new username and password

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *User Settings* under the section *Configuration*.
2. In the text field next to *New Username*, type the new name.
3. In the text field next to *New Password*, type the new password.
4. Confirm the password in the field *Re-type Password*.
5. Click **Accept**.



The default username and password are **“Admin”** and **“1988”**, respectively; changing the password as soon as possible is highly recommended.

Personal Area Network (PAN)

Network

The *Network* page allows you to modify the status of the Personal Area Network.



FIG. 10 Network Page

Network Page	
Network status	Lists whether the network is online or offline.
Wireless	Enables or disables the ZigBee wireless networking.
PAN ID	The current PAN ID number for the device.
Country/Region	Drop down menu; sets ZigBee region (US, Europe, Japan).
Channel	Drop down menu; sets the ZigBee operating channel between 11 and 26. The default channel is 26.

Enabling and disabling the wireless network

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Network* under the section *Pan*.
2. Click the radio button next to *Enable* to enable the wireless network or select *Disable* to disable the network.
3. Click **Accept**.

Connecting an NXR-ZRP to the network for the first time

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Network* under the section *Pan*.
2. In the *PAN ID* field, enter the default PAN ID for the repeater: **3FFF**.
3. Click **Accept**.
4. Select the *Connections* tab; the repeater should appear on the router.
5. Click on the EUI-64 link to open the *Device Details* page.
6. In the *PAN ID* field, enter the desired PAN ID for the repeater within the network.
7. Click **Update Settings**.
8. Repeat steps 1-6 for each repeater to be added to the network.
9. Select the *Network* tab under the section *Pan* and enter the desired PAN ID in the *PAN ID* field.

10. Click **Accept**.

Setting the PAN channel

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Network* under the section *Pan*.
2. Click the radio button to *Disable* the wireless network. This activates the Country/Region and Channel dropdown menus.
3. Select your country or region of operation from the drop down menu.
4. Select the Channel number from the drop down menu.
5. Click **Accept**.

Connecting a Repeater to the Gateway

When first installed and powered up, all repeaters will look for Gateway PAN ID **3FFF**, regardless of the signal strength of other gateways with different PAN IDs. You have to change your Gateway to PAN ID **3FFF**. The repeater will connect to the Gateway. You then can reset PAN IDs to your preferred setting (see below) through the Gateway Browser-Based Configuration Manager.

1. Set gateway to PAN ID **3FFF**. (See the *PAN Device Details* section on page 23 for more information.)
2. Reboot the Gateway.
3. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Connections* under the section *Pan*. The repeater should already be connected.
4. Click on the *Repeater* link under the *EUI* column. Note that the description field will be blank.
5. Change the Repeater PAN ID to your desired Gateway PAN ID.
6. Click the **Update Settings** button.
7. Return the Gateway PAN ID to your desired PAN ID.
8. Reboot the Gateway.

Connections

All devices connected to the NXR-ZGW is displayed on this page.



FIG. 11 Connections Page

Each device provides the following:

Connections Page	
No.	The Netlinx ID number.
EUI-64	The 64 bit ZigBee EUI address of the device.
Description	The device's description, supplied by the device.
Type	The specific type of device being accessed.
Latency	A measure of the amount of time (in milliseconds) for a message round-trip from the device to the gateway and back.
LQI	LQ is the link quality of the RF path between the PAN coordinator and the device. Quality levels are: <ul style="list-style-type: none"> • not recommended • edge • marginal • good
Status	The current status of the device: either "Active" or "Asleep".

Finding a device's EUI address

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Connections* under the section *Pan*.
2. The EUI address is located in the *Connections* table under "EUI-64". Click on the EUI address to open the *PAN Device Details* page for this device. (See FIG. 12)

Finding the device's description

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Connections* under the section *Pan*.
2. The device's description is located in the table under "Description".

Determining the device type

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Connections* under the section *Pan*.
2. The device type is located in the table under "Type".

Finding the amount of time a signal takes from the device to the gateway and back

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Connections* under the section *Pan*.
2. The "Latency" column lists the amount of time the current signal takes to go from the device to the gateway and back again.

Determining the device link quality

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Connections* under the section *Pan*.
2. The link quality is located in the table under the "LQI" column. The status of the channel is as follows: green is good all the way to red, not recommended.

Checking the device link status

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Connections* under the section *Pan*.
2. The status of the device is located in the table under the "Status" column.

PAN Device Details

From the *Connections* page, clicking on a device's EUI-64 number opens the *PAN Device Details* page.

The screenshot displays the 'PAN Device Details' page in the AMX Configuration Manager. The page is divided into several sections:

- Device Options:** Includes a toggle for 'On Access List' which is currently set to 'Off'.
- Connected Device:** Shows 'Device Type: ICSP Device', 'Device Description: Mio R-3', 'Status: Awake', and 'ICSP Connection: Connected'.
- Device Networking:** A table with two columns: 'Device Networking' and 'Device Information'.

Device Networking	Device Information
EUI-64: 00-00-5F-00-00-09-71-42	Power Sources: Unknown
Node ID: 1	Current Power: Unknown
Link Quality: 255	Power Level: Low
Traffic RX: 36	Host F/W Version: c1.09
Traffic TX: 1	Node Type: Coordinator
Latency: 88 ms	
- Zigbee Networking:** Includes 'Application Version' and 'Pan ID' (0037) with a note: 'A Pan Id 0xFFFF will join the closest network. Please set to Pan Id of desired gateway to insure proper joining.' It also shows an 'AES Key' field.
- Connection Log:** A table showing connection events:

#	Connection	EUI-64	Device #
1	Zigbee Join - Initial	00-00-5F-00-00-09-71-42	N/A
2	ICSP Join - Device Info Received	00-00-5F-00-00-09-71-42	100
3	ICSP Join - Device Connected	00-00-5F-00-00-09-71-42	100

At the bottom, there is a copyright notice for 2009 AMX and a 'WEB SERVER' logo.

FIG. 12 PAN Device Details Page

Each device provides the following:

PAN Device Details Page	
Device Options	<ul style="list-style-type: none"> • On Access List: Controls whether the device is on the access list for the Connections page. • Locate: Finds the location of the device if active.
Connected Device	<ul style="list-style-type: none"> • Device Type: The type of network device. • Device Description: Description of the device as entered on PAN. • Status: Whether the networked device is active or asleep.
Device Networking	<ul style="list-style-type: none"> • EUI-64: The 64-bit ZigBee EUI address of the device. • Node ID: The 16-bit ZigBee short address of the device. • Link Quality: The quality of the connection to the network. • Traffic: The traffic byte count of the device. • Latency: A measure of the amount of time (in milliseconds) for a message round-trip from the device to the gateway and back.
Device Information	<ul style="list-style-type: none"> • Power Sources: All of the possible sources for power for the device, including mains electric power and battery backup • Current Power: Current power source being used by the device. • Power Level: Amount of required power being received by the device. • Host F/W Version: Latest firmware version installed in the device. • Node Type: The type of node used by the device.

PAN Device Details Page (Cont.)	
ZigBee Networking	<ul style="list-style-type: none"> • Application Version: The version of the ZigBee application being used. • Pan ID: ID number for the device within the PAN.
Connection Log	The device or devices currently or previously connected to the network.

Putting a device on the Access List

1. From the *PAN Device Details* page, check to see if the *On Access List:* button in the *Device Options* section is on or off.
2. If the button reads **Off**, click it once. This will open a window reading "This will change On Access List to 'On'. Any changes entered to the Connected Devices Section below will be lost. Are you sure you wish to continue?"
3. Click **Yes** to continue. If the device is active, the *PAN Device Details* page will refresh, showing the new **On** status. If the status remains **Off**, check the device's connection.

Removing a device from the Access List

1. From the *PAN Device Details* page, check to see if the *On Access List:* button in the *Device Options* section is on or off.
2. If the button reads **On**, click it once. This will open a window reading "This will change On Access List to 'Off'. Any changes entered to the Connected Devices Section below will be lost. Are you sure you wish to continue?"
3. Click **Yes** to continue. If the device is active, the *PAN Device Details* page will refresh, showing the new **On** status.

Locating the device

1. From the *PAN Device Details* page, check to see if the *Locate:* button in the *Device Options* section reads **Active** or **Inactive**.
2. If the button reads **Inactive**, click it once. This will open a window reading "This will change Locate to 'Active'. Any changes entered to the Connected Devices Section below will be lost. Are you sure you wish to continue?"
3. Click **Yes** to continue. If the device is active, the *PAN Device Details* page will refresh, showing the new **Active** status.

Changing a Connected Device description

1. From the *PAN Device Details* page, enter a Device Description in the field of the same name in the *Connected Device* section. This description usually includes the name of or nickname for the device and its physical location, but anything may be entered.



NOTE

While over 200 characters may be entered into the Device Description field, descriptions should be short but informative.

2. To save the device description, click the **Accept** button.

Changing a device's ZigBee networking information

1. The *PAN Device Details* page also allows users to enter a new PAN ID number for a particular device, if the device is currently active. To enter a new PAN ID number, enter the new number in the *PAN ID* field.
2. Click the **Accept** button. A new window opens that reads "Are you sure you wish to accept these new changes?" Click **OK** to accept the new changes.
3. If the device is active, the *PAN Device Details* page will refresh, displaying the completed changes.

Utilities

Device Firmware

The device details page shows all the information about the status of firmware on a network's devices.



FIG. 13 Device Firmware Page

Device Firmware	
Updates	Permissions to allow firmware uploads to the selected device.
EUI-64	The 64-bit EUI address of the device.
Description	The name and location of the device, as provided by the device.
Status	The current activity of the device, whether active or asleep.
Version	The last uploaded version of the ZigBee firmware.
Uploads Allowed	Displays whether or not the device may have further upgrades to its firmware.

Allowing firmware updates to individual devices

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Device Firmware* under the section *Utilities*.
2. Choose the device to be updated by its EUI-64 number.
3. Click the button next to the device's EUI-64 number in the *Allow Updates* column. The page will automatically refresh, displaying the device's new status.
4. Some devices cannot have their firmware update status changed; these devices will continue to read **Off** even after selecting to allow new updates.

Allowing firmware updates to all devices on a network

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Device Firmware* under the section *Utilities*.
2. In the *Allow Updates* column, click **All On** or **All Off** to allow or block upgrades to all devices on the network. The page will automatically refresh, displaying the new status of all network devices.
3. Some devices cannot have their firmware update status changed; these devices will continue to read **Off** even after selecting to allow new updates.



NOTE

Clicking on the EUI-64 number in the Device Firmware page will open the device's PAN Device Details page (see FIG. 12).

Connection Log

The connection log is a list of all recent ZigBee device activity.



FIG. 14 Connection Log Page

Connection Log Page	
#	The device's NetLinX ID number
Connection	Indicates the connection status of the device.
EUI-64	The 64-bit EUI address of the device.
Device #	The device's ICSP device number.

Determining the connection status of a device

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Connection Log* under the section *Utilities*.
2. The connection status of each device is located in the column *Connection*; the possible values are either *Connected* or *Disconnected*.

Finding a device's EUI address

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Connection Log* under the section *Utilities*.
2. The EUI address of each device is located in the column *EUI-64*.

Finding the device's ICSP number

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Connection Log* under the section *Utilities*.
2. The ICSP number of each device is located in the column *Device #*.



NOTE

Clicking on the EUI-64 number in the Connection Log page will open the device's PAN Device Details page (see FIG. 12).

Traffic Log

The traffic log shows traffic statistics for all ZigBee devices.



FIG. 15 Traffic Log Page

Traffic Log Page	
Device #	The device's ICSP device number.
EUI-64	The 64-bit EUI address of the device.
Description	The device's description, supplied by the device.
Device Type	The types are: <ul style="list-style-type: none"> • End Device • Repeater • PAN coordinator.
RX	The total number of bytes received by the device since it connected.
TX	The total number of bytes transferred to the device since it connected.

Finding the device's ICSP number

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Traffic Log* under the section *Utilities*.
2. The ICSP number of each device is located in the column *Device #*.

Finding a device's EUI address

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Traffic Log* under the section *Utilities*.
2. The EUI address of each device is located in the column *EUI-64*.

Finding the device's description

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Traffic Log* under the section *Utilities*.
2. The description of each device is located in the column *Description*.

Determining the device type

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Traffic Log* under the section *Utilities*.
2. The type of each device is located in the column *Device Type*.

Finding the device traffic

1. In the menu on the top of the NXR-ZGW Browser-based Configuration Manager, select *Traffic Log* under the section *Utilities*.
2. The traffic byte count of each device is located within the columns RX and TX. RX lists received traffic, while TX lists transmitted traffic



NOTE

Clicking on the EUI-64 number in the Traffic Log page will open the device's PAN Device Details page (see FIG. 12).

Device Configuration

Sending Firmware to The NXR-ZGW

Before beginning the Upgrade process

- Set up and configure your NetLinx Master. Refer to your particular NetLinx Master instruction manual for detailed setup procedures.
- Prepare the communication on the NXR-ZGW for use. Refer to the *Setting up a Network* section on page 13.
- Refer to the NetLinx Studio version 2.4 or higher Help file for information on uploading firmware files via Ethernet.



If power or connection fails during a firmware upgrade, the file system may become corrupted.

A NXR-ZGW which is not using a valid username and password will not communicate with a secured Master. If you are updating the firmware on a keypad which is not using a username or password field, you must first remove the Master Security feature to establish an unsecured connection.

Upgrading The NXR-ZGW via An IP Address

Before beginning this section, verify that your device is powered and connected to the NetLinx Master through an Ethernet connection.

Preparing the Master for communication via an IP

1. Obtain the IP Address of the NetLinx Master from your System Administrator. If you do not have an IP Address for the Master, refer to your particular Master's instruction manual for more information on obtaining an IP Address using NetLinx Studio 2.4 or higher.
 - From the **Online Tree** tab of the Workspace window, select the NetLinx Master.
 - Follow steps outlined in either the *Obtaining or Assigning the Master's IP Address* sections from your particular NetLinx Master instruction manual to use an address.
 - Note the IP Address and Gateway information.
2. Launch NetLinx Studio 2.4 (default location is **Start > Programs > AMX Control Disc > NetLinx Studio > NetLinx Studio 2.4**).

3. Select **Settings > Master Communication Settings**, from the Main menu to open the Master Communication Settings dialog (FIG. 16).

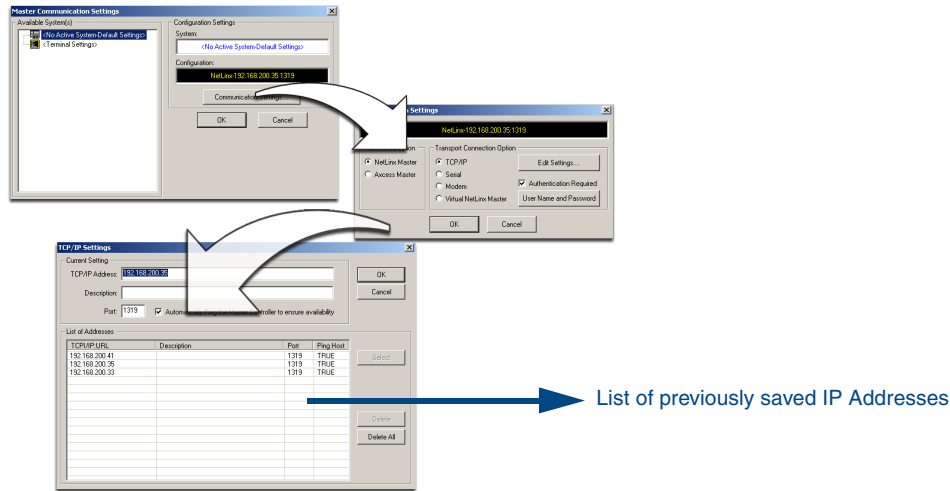


FIG. 16 Assigning Communication Settings and TCP/IP Settings

4. Click the **Communications Settings** button to open the *Communications Settings* dialog.
5. Click on the **NetLinx Master** radio button (from the *Platform Selection* section) to indicate that you are working with a NetLinx Master (such as the NXC-ME260 or NI-Series of Integrated Controllers).
6. Click on the **Authentication Required** radio box (if the Master is secured) and then enter a username and password.
7. Click on the **TCP/IP** radio button (from the *Transport Connection Option* section) to indicate you are connecting to the Master through an IP Address.
8. Click the **Edit Settings** button (on the *Communications Settings* dialog) to open the TCP/IP Settings dialog (FIG. 16).
9. Enter the IP Address into the *TCP/IP Address* field. This information is obtained from either your System Administrator or obtained from the Master.
10. Click **OK** three times to close the open dialogs and save your settings.
11. Click **Yes** to interrupt the current communication from the Master and apply the new settings.
12. Select **Tools > Reboot the Master Controller** to access the Reboot the Master dialog, then click **Reboot** to reboot the Master and incorporate any changes.
13. Once the dialog replies with "Reboot of system complete", press **Done**.
14. Click the **OnLine Tree** tab in the Workspace window to view the devices on the System. *The default System value is one.*
15. Right-click on the *Empty Device Tree/System* entry and select **Refresh System** to re-populate the list.

Verifying and Upgrading the device firmware via an IP

1. Click the **OnLine Tree** tab in the Workspace window to view the devices on the System. *The default System value is one.*
2. Right-click the associated System number (from the Workspace window) and select **Refresh System** to detect all devices on the current system, establish a new connection to the Master, and refresh the System list with devices on that system.

3. After the *Communication Verification* dialog window verifies active communication between the PC and the Master, verify the NXR-ZGW appears in the **OnLine Tree** tab of the Workspace window. *The default device value is 10001.*
4. If the device firmware version is not the latest available; locate and download the latest firmware file from the www.amx.com > **Tech Center** > **Downloadable Files** > **Firmware Files** section of the website.
5. Select **Tools** > **Firmware Transfers** > **Send to NetLinx Device** from the Main menu to open the Send to NetLinx Device dialog (FIG. 17). Verify the device's System and Device number values match those values listed within the System folder in the **OnLine Tree** tab of the Workspace window.

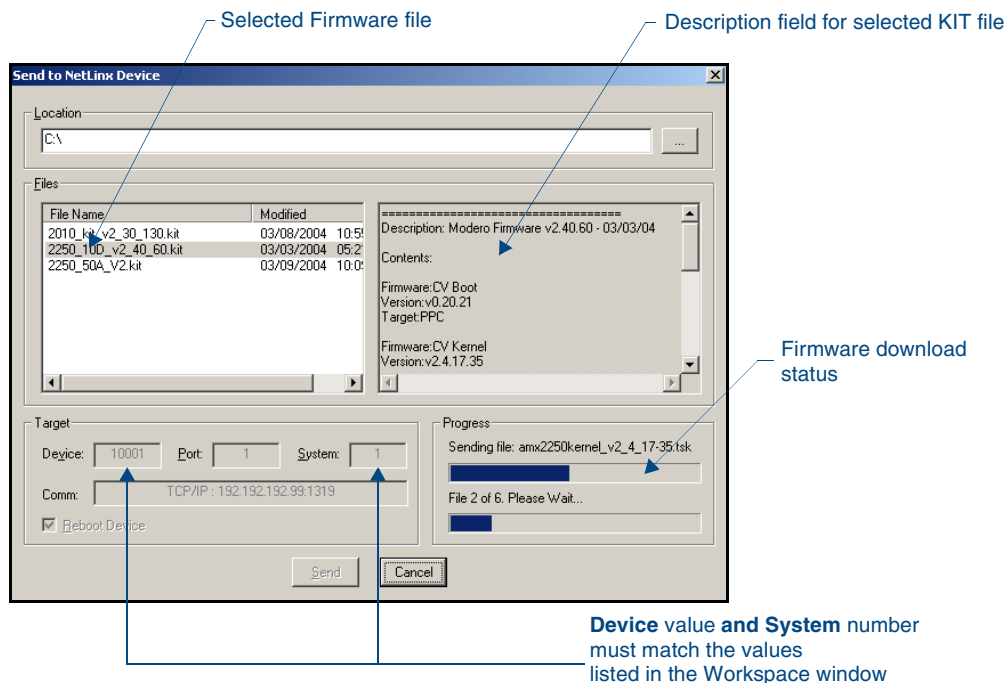


FIG. 17 Send to NetLinx Device dialog

6. Select the device's firmware file from the **Files** section (FIG. 17).
7. Enter the **Device** value associated with the device and the **System** number associated with the Master (*listed in the OnLine Tree tab of the Workspace window*). The Port field is greyed-out.
8. Click the **Reboot Device** checkbox. This causes the NXR-ZGW device to reboot after the firmware update process is complete.
9. Click **Send** to begin the transfer. The file transfer progress is indicated on the bottom-right of the dialog (FIG. 17). Do not pull power from device during transfer, it can take approximately 5 minutes to finalize firmware transfer. The upgrade can still be in progress when the bargraph reaches the end, it is a good idea to wait until the process is complete.
10. Click **Close** (*after the device reboots*) to return to the main program.
11. Right-click the associated System number and select **Refresh System**. This causes a refresh of all project systems, establishes a new connection to the Master, and populates the System list with devices on your particular system.

Using the ID Button to Change the NXR-ZGW's Device Number

1. Launch NetLinX Studio 2.4 (default location is Start >Programs > AMX Control Disc > NetLinX Studio > NetLinX Studio 2.4).
2. Access the Device Addressing dialog (FIG. 18) by selecting **Diagnostics > Device Addressing** from the Main menu.

Enter the new NXR-ZGW value

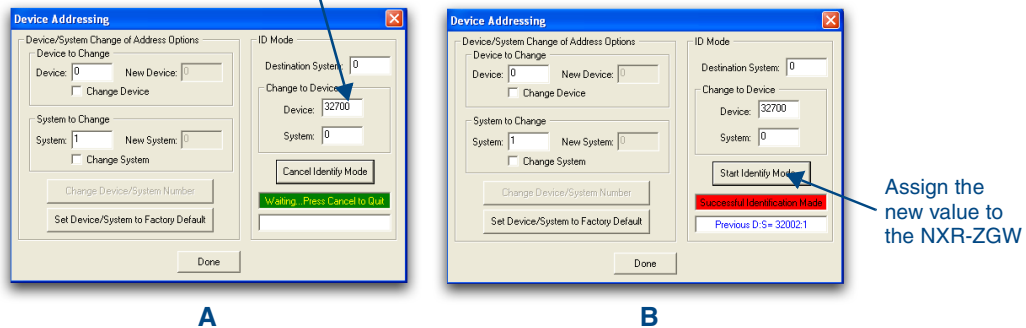


FIG. 18 Device Addressing dialog (using the ID mode to set the NXR-ZGW device value)

3. Locate the *Device* field (A in FIG. 18) and enter the new value for the NXR-ZGW. ***This value must fall within a range of 0 - 32767.***
4. Press the on-screen **Start Identify Mode** button.
 - This action causes a previously red **Not Active** field to now display a green *Waiting...Press Cancel to Quit* field.
 - This green field indicates that Studio is waiting to detect the device value of the NXR-ZGW associated with the **ID** button on the target NXR-ZGW.
5. Press the target NXR-ZGW's **ID** button to begin process of reading the current device value of the NXR-ZGW and then assigning it to the new value entered in step 2.
 - Once the swap has been successfully made, a red *Successful Identification Made* field appears.
 - The previous Device value and associated System number of the targeted NXR-ZGW are then displayed below the red field. As an example, *Previous D:S=32002:1*, where 32002 was the previous device value of the NXR-ZGW (**D**) and 1 was the System value (**S**).



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